

Unit 1 Test - Practice

Expectation	Level
A1 - expand and simplify quadratic expressions, solve quadratic equations, and relate the roots of a quadratic equation to the corresponding graph	
A2 - demonstrate an understanding of functions, and make connections between the numeric, graphical, and algebraic representations of quadratic functions	

1. Expand and simplify the following:

a) $(3n - 2)^2 + (3n + 2)^2$

b) $-2(3a + b)(3a - b)$

c) $-5(x+7) + 8(x-2) - 3(2-x)$

d) $7x(x+2) - (x-2)(x+6)$

2. Fully Factor

a) $3a^3 + 27a^2$

b) $3p(5 - 7p) - 2(7p - 5)$

c) $r^2 + rs - 42s^2$

d) $16g^2 - 49h^2$

e) $x^2 + 12x + 36$

f) $w^2 + 9w + 20$

g) $10x^2 - 29x + 10$

h) $2w^2 + 11w + 12$

i) $24z^2 - 13z - 2$

a) $2k^2 - 68k - 144$

b) $3q^2 - 75$

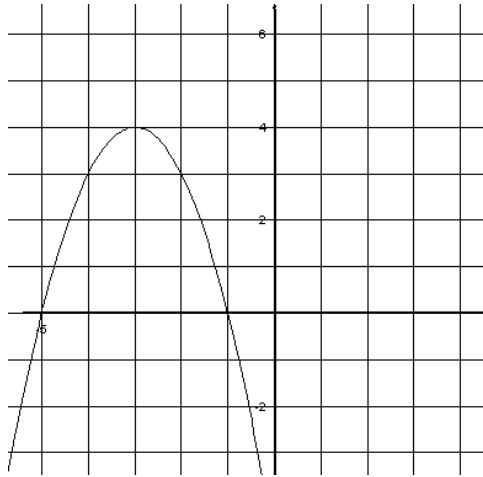
c) $2y^2 - 16y + 32$

d) $6a^2 - 21a + 15$

a) $x^8 - 1$

b) $t^4 - 17t^2 + 16$

3. A rectangle has a width of $4j-1$ and a length of $6j+3$
- Sketch** the rectangle with labeled sides.
 - Write an expression that would represent its area as a **simplified** polynomial.
 - Write **simplified** expressions for the dimensions if the **width** is doubled and the **length** is increased by 2.
 - Write the new area as a **simplified** polynomial.
4. Find the roots of each of the following equations.
- $2x^2 - 9x - 5 = 0$
 - $x^2 = 121$
 - $3(x-2)^2 = 2(x^2 - 4)$
 - $x^3 - 4x^2 + 11x + 25 = x^3 - 5x^2 + x$
5. A rock is thrown from a cliff into the water. The rock's height above the water is modeled by the function $h(t) = -5t^2 + 10t + 175$, where $h(t)$ is the height in metres and t is time in seconds.
- When will the rock reach the water below the cliff?
 - When will the rock reach a height that is 100 m above the water?
6. Determine $f(-\frac{1}{2})$ when, $f(x) = 6x^2 + 7x + \frac{3}{4}$
7. Determine $f(-2)$ when,



8. If $f(x) = 3x^2 - 9x + 27$, find $f(0)$, $f(1)$, $f(-1)$